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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/730,783	12/07/2000	Sang Jin Oh	2832-0118P	8908

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EXAMINER

OLSEN, ALLAN W

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 06/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/730,783

Applicant(s)

OH ET AL.

Examiner

Allan W. Olsen

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM  
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 March 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**DETAILED ACTION*****Specification***

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The written description does not address the claimed rotation of the forming roll during the ultrasound enhanced etching step. Figure 4 appears to be the only support for this new limitation.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claims 1, 3-6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,709,598 issued to Nishio et al. in view of U.S. Patent 5,021,120 issued to Buck et al. and further in view of US Patent 5,858,106 issued to Ohmi et al. (hereinafter, Nishio, Buck and Ohmi).**

Nishio teaches a method of forming a patterned abrasive tape. The abrasive tape becomes patterned because it is fabricated upon a patterned forming roll (roll punch). Nishio patterns the forming roll by applying a photoresist and patterning the resist to form an etching mask and then etching the underlying roll. Nishio teaches removing the photoresist etching mask before using the patterned roll for its intended purpose. Nishio teaches forming recesses

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with vertical sidewalls. See: column 5, lines 20-32; column 6, lines 24-30 and 45-53; column 7, lines 20-53; column 8, lines 1-10.

Nishio does not teach removing the masking layer with a cutting bite.

It would have been obvious for one skilled in the art to use a cutting bite to pattern the etching mask for the following reasons. Nishio teaches that a surface, such as that of the forming roll, can be patterned in a variety of ways, including physically or mechanically removing portions of the surface, as well as chemically etching the surface through a patterned mask. Nishio does not discuss at length the well known aspects of such processes. For example, Nishio does not extensively detail the manner in which the etching mask is patterned. It would however, be obvious to create a pattern in the etching mask by using any one of the patterning methods that are disclosed by Nishio, for example, engraving or machining on a lathe.

Nishio does not describe removing the workpiece from the etchant prior to the step of removing the photoresist mask.

It would have been obvious to one skilled in the art to remove the workpiece from the etchant prior to the step of removing the etching mask because it is well known that the etchant that will remove the photoresist mask is very different from the etchant that is used to etch the exposed portions of the metallic workpiece. Therefore, the workpiece must be provided with a different etching environment in order to remove the etching mask. The examiner notes that Buck clearly demonstrates this principle

Nishio does not teach rotating the workpiece in an etchant bath while applying ultrasound to etch the exposed portions of the forming roll.

Buck teaches etching the exposed portions of a workpiece by agitating a workpiece that is immersed in an etchant bath to which ultrasonic energy is being provided by multiple ultrasonic sources that are disposed around the workpiece (abstract; col. 3, lines 4-7; figure 1).

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It would have been obvious for one skilled in the art to use ultrasound while etching the exposed portions of Nishio's forming roll because Buck teaches that the application of ultrasound prevents the formation of localized regions of low etchant concentration and thereby provides a highly uniform etching process (column 1, line 17- column 2, line 3).

Neither Nishio nor Buck teaches applying ultrasonic energy to a rotating workpiece while contacting the workpiece with an etchant.

Ohmi teaches immersing a workpiece in an etching solution and applying ultrasound thereto (column 3, lines 26-27). Ohmi teaches moving the workpiece both vertically and laterally while the immersed workpiece is sonicated (column 6, lines 21-40).

It would have been obvious to one skilled in the art to rotate a workpiece during an ultrasound enhanced etching process because rotating the workpiece is a simple means of providing the agitation that is called for by Buck. Also, Ohmi teaches that moving a workpiece within a sonicated bath causes the ultrasound to be more uniformly applied (column 6, line 36). Furthermore, a simple rotation around the horizontal axis of Nishio's forming roll would cause localized portions of the workpiece to simultaneously undergo the vertical and horizontal movements that are called for by Ohmi.

**Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishio, Buck and Ohmi as applied to claim 1 above and further in view of U.S. Patent 5,182,188 issued to Cole, Jr. et al. (hereinafter, Cole).**

The combination of Nishio, Buck and Ohmi does not teach the use of a laser beam for the step of partially removing the etching mask.

Cole teaches using a laser beam to partially remove an etching mask (col. 3, line 58).

It would have been obvious for one skilled in the art to use a laser beam to partially remove the etching mask of Nishio because Cole teaches that patterns with very high resolutions can be obtained (column 6, line 48).

***Response to Arguments***

Applicant's arguments filed March 12, 2003 have been fully considered but they are not persuasive. Applicant does not argue the manner in which the references have been applied. Instead, Applicant's arguments focused exclusively upon the newly added limitation. The examiner addressed the newly added limitation in the above rejection.

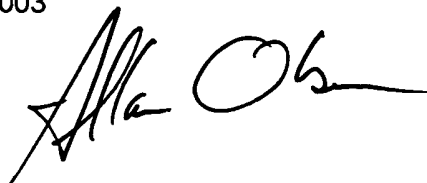
***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allan Olsen whose telephone number is 703-306-9075. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Greg Mills, can be reached on 703-308-1633. The examiner's Right-Fax (direct to desktop) phone number is 703-872-9684. Alternatively, the general fax numbers for TC1700 are 703-872-9310 (non-after finals) and 703-872-9311(after-final). Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

Allan Olsen, Ph.D.  
May 31, 2003

A handwritten signature in black ink, appearing to read 'Allan Olsen', is written over the typed name and date.